

32 is formed to the minimum size and the subsequent ones are successively increased in size. In Figure 20b, element 20 is a "mounting substrate" (e.g. a printed circuit board), not a semiconductor substrate. As indicated by Yamada in column 12 at lines 18-19, "reference numeral 38 indicates the semiconductor device." Hence Yamada fails to disclose the claimed feature of a bump comprising a coaxially-aligned stack of bodies having different cross-sectional dimensions, said bodies at the top of said stack having small cross-sectional dimensions. Therefore, Applicant respectfully submits that Claim 1 is patentable over Yamada. Claims 2, 3, and new claims 9-12 depend from Claim 1 and are therefore patentable over Yamada for at least the reasons presented above.

Claims 1-6 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada, et al. in view of Kanda, et al. (U.S. Patent No. 6,153,938). Applicant respectfully traverses the rejection. As described above, Yamada fails to teach or suggest all of the features of Claim 1. In fact, Yamada teaches away from the claimed invention by teaching balls of a minimum size on the contact pad followed by subsequent balls of increasing size. Kanda, cited for its teaching of a gold bump, does not cure this deficiency of Yamada. Therefore, Applicant respectfully submits that Claim 1, and Claims 2, 3, and 9-12 depending therefrom, are non-obvious and patentable over Yamada in view of Kanda.

New Claim 13 includes distinguishing features similar to those in Claim 1 as well as the further features of said contact pad being on an insulating layer on said substrate and of a barrier layer between said bump and said contact pad. Therefore, Applicant respectfully submits that Claim 13, and Claims 14-17 depending therefrom, are patentable over the cited references.

New Claim 18 includes distinguishing features similar to those in Claim 1 as well as the further features of a printed circuit board, wherein the semiconductor substrate is mounted over the printed circuit board such that the contact pad and the first and second bumps are aligned with a conductive film on

the printed circuit board. Therefore, Applicant respectfully submits that Claim 18, and Claims 19-22 depending therefrom, are patentable over the cited references.

Applicant respectfully requests reconsideration and withdrawal of the rejections and allowance of Claims 1-6 and 9-22. If the Examiner has any questions or other correspondence regarding this application, Applicant requests that the Examiner contact Applicant's attorney at the below listed telephone number and address.

Respectfully submitted,



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In the Claim :

Please amend the claims as follows:

1. A semiconductor device, comprising:
a contact pad on a semiconductor substrate;
a conductive bump on said contact pad, said bump comprising a coaxially-aligned stack of bodies having different cross-sectional dimensions, said bodies at the top of said stack having smaller cross-sectional dimensions.